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1.0 Introduction

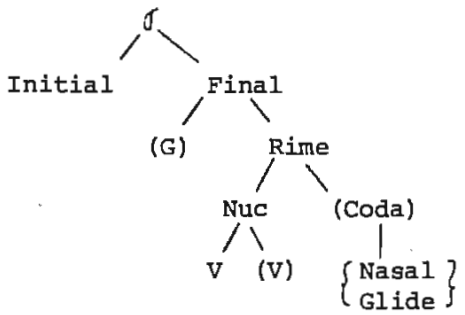
Fuzhou, a Northern Min dialect of Chinese, has received attention in the linguistics literature since 1934 when Y.R. Chao put forth the claim that tone changes conditioned vowel quality in this dialect. This position has been debated by various authors, most recently by Maddieson (1976), who suggests that vowel changes are independent of tone changes, and Yip (1980), who correlates vowel and tone changes, albeit in a reverse direction to that advocated as historically valid by Chao.

The analysis of Fuzhou presented here relates both the vowel changes and tonal changes to a third factor, stress. Fuzhou sandhi spans receive rightmost stress, and the basic claim of the analysis is that weakened stress is manifested as shortened duration.[1] Therefore, sandhi span and foot will be used interchangeably here. The vowel changes and tonal changes of the weak member of the foot will be related to the shortened duration. Tone changes will be discussed first, followed by a discussion of vowel changes.

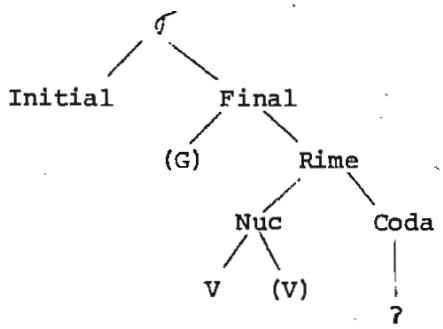
1.1 Basic Data

Fuzhou morphemes are, without apparent exception, monosyllabic. Each syllable/morpheme belongs to one of seven categories,[2] which are usually considered to be tonal categories, and are here given the traditional designations of IA-IVB, with the IIB historical category missing from Fuzhou. Categories I-III are either open or nasal final, with syllable structure as shown in (1a), whereas IV syllables are syllables with final glottal stop, as in (1b).

(1a)



(1b)



These basic syllable structures are not uncontroversial, but they will be discussed and revised in Section 2.

The syllables of each category receive a basic tonal contour, given below in the system developed by Chao (1933), where 5 stands for highest pitch and 1 for lowest pitch. Underlining shows final ? syllables.

(2) Fuzhou Citation Contours

IA	44
IB	52
II	22
IIIA	12
IIIB	242
IVA	13
IVB	4

1.2 Tone Sandhi Data

Fuzhou exhibits both interior and exterior tone sandhi, that is, sandhi appears both within groups which will be called compounds,[3] and across word boundaries, such as between a verb and a following noun. For simplicity, the discussion will be limited to disyllabic groups, in most cases, compounds. Within the disyllabic span, the second syllable displays the citation contour of its class, given above, and the first syllable displays a tonal contour which differs in most cases from the citation contour. Furthermore, there is not just one sandhi possibility for the first syllable, but rather, two possibilities exist, the choice being determined by the tonal contour of the second syllable in the span. The following chart gives the data in an abstracted form, examples are given in the Appendix. The chart is read as follows. The possible tonal contours of the second syllable are given across the top of the chart; the possible basic tonal contours of the first syllable are given reading down the chart; and the numbers within the chart show the sandhi forms exhibited by the first syllable. The IVA category splits into two groups, which will be called IVA1 and IVA2. Tone classes have been rearranged to capture generalities visually.

TABLE I

(3) Disyllabic Tone Contours for Fuzhou[4]

	44(IA)	52(IB)	4(IVB)	22(II)	242(IIIB)	12(IIIA)	13(IVA)
44(IA) 242(IIIB) 12(IIIA) 13(IVA1)	44			52			
22 13	22			35			
52	22			22			
4 (IVB)	44			22			

It can be seen from Table I that categories IA, IIIA, IIIB and IVA1 form one sandhi group, and that II and IVA2 form another sandhi group. It can also be seen that the second syllables can be divided into those which have an initial high pitch and those which have a relatively low pitch.

1.3 Citation Representations

This analysis will employ an autosegmental framework in the broadest sense, meaning that the representations of the tonal features form a separate level of representation apart from the segmental features of the morpheme and that the tonal features will be related via mapping conventions to the segments in question. Furthermore, this analysis will use a system that views contour tones as concatenations of level tones.[5]

The first question to be resolved is the number of tone levels within the Fuzhou system. We have a contrast between high and low level tones, i.e., 44, 4 versus 22, with no contrasting mid level noted, so that it would be desirable to employ a two level phonological system if possible. The falling 52 could be easily accomodated within such a system. However, IIIA and IVA rise only to a mid level in the data given above. Note, however, that we do not find these contrasting with a low to high tone, and some data (see Corbato (1943))gives 15 and 24 for these tone categories. Additional evidence for an underlying H final tone on the IIIA class can

be drawn from the behavior of directional verbal particles, whose pitch is parasitic on the tone of the preceding syllable. Those particles following a syllable ending on a low pitch receive a low tone, whereas those following a syllable ending on H or rising tone receive a high tone:

(4)

爬 起 來
run - up - come
'run away (to here)'

$p'a^{52}$	$k'ei^{12}$	$li^{52} \Rightarrow$
$p'a^{52}$	$k'i^{2°}$	$li^{2°}$

遏 落 來
drop - fall - come
'drop down'

$tauŋ^{242}$	$lɔ?^{13}$	$li^{52} \Rightarrow$
$tauŋ^{242}$	$lɔ?^{2°}$	$li^{2°}$

BUT 帶 出 去
carry - out - go
'carry out'

tai^{12}	$ts'ou^{12}$	$k'au^{12} \Rightarrow$
tai^{12}	$ts'ou^{5°}$	$k'ə^{5°}$

Let us assume therefore that the rising tones have a basic LH representation, with phonetic rules lowering a H after L when the syllable receives full stress, i.e. is at the end of the sandhi domain or in isolation. That this is not unwarranted may be argued from sentential intonation in which declination of H occurs after L.[6]

Therefore, the analysis assumed H and L as primitives. Final representations for the citation tones will be given below, but here a word is in order about duration. Categories IA and IVB both represent high level tones; however, syllables of IA are noticeably longer than those of IVB, which are one mora in length. Furthermore, syllables of IIIB are longest of all isolation syllables, and often show the full expansion of VVG sounding almost like two syllables as in $t\underline{ɔai}^{242}$ 'large'. One could designate H as the expression of the level tones of both IA and IB syllables, with mapping onto moras, but exposition of the sandhi changes will show a more illuminating picture if length of syllables is included within the tonal representation. Therefore, we give somewhat hybrid representations for the Fuzhou syllable-tone classes, with HH showing a long high level tone, and H showing a short level tone. The representations for the entire inventory are then as follows:

(5)

IA (44)	HH
IB (52)	HL
II (22)	LL
IIIA (12)	LH
IIIB (242)	LHL
IVA1	LH
IVA2	LL[7]
IVB	H

1.4 Tone Sandhi Analysis

The analysis of the tone sandhi draws on work by Yip (1980), although the analysis is much simplified. However, Yip advocates a three-level system, divided into Upper and Lower Registers to account for the vowel changes mentioned in Section 1.0 above, and this Register system is only incidentally useful in accounting for the sandhi changes. Since this analysis proposes to account for vowel changes in terms of duration rather than tonal conditioning, the Register arguments are considerably weakened. It has been shown that a two level system will account for the citation contours, and the directional particles. A system including Register would require fairly complicated rules to account for the particles after rising tones, and therefore we dispense with Register and simplify many of the required rules.

We can re-examine Table I and note that before tones which begin on a H pitch, there are two possibilities for tonal contours, H and L. Except for the IIIB (242) category, these correlate with the rightmost tone of the isolation representations. The tone on IIIB will also correlate if the final L is lost. We follow Yip and assume a LHL simplification in weak position:

(6) LHL Simplification

$$L \rightarrow \emptyset \; / \; LH\underline{\quad}_{W}$$

For weak syllables before strong high-pitched initial syllables, deletion of the first initial tone marker for all classes but IVB (4) would yield a single tone marker of the correct pitch to be mapped onto the segments of the syllable. Deletion of the H of IVB would leave this syllable toneless but we have seen from the behavior of verbal particles that syllables which are stripped of tone receive pitch parasitically from adjacent syllables. Therefore, a rule of Initial Tone Deletion would yield correct results for all classes before strong high tones. This rule will be written as in (7).

(7) Initial Tone Deletion

$$T_1 \rightarrow \emptyset \; / \; [_{\varphi}\underline{\quad}$$

This rule is similar to Yip's Initial Tone Deletion rule, although more general than hers as we see below.

Before committing ourselves to such a rule, we need to examine the sandhi forms before strong L-initial syllables. The possibilities for sandhi contours are HL for those with a second H in the citation form, L for IVB, which would follow from an Initial tone deletion. However, the two groups which showed a L sandhi before strong H-initial split before L-initials. Those derived from HL show the second L tone before L, whereas those derived from original LL show a rising tone.

Two questions arise. One, is it necessary now to backtrack and posit a three level system to express the 35 rising contour? I suggest that the 35 can be analyzed as a LH in light of the facts of the overall intonation contour of HL over the disyllabic span, as noted in footnote 6.

The second point is more crucial. If we have the general rule of Initial Tone Deletion applying to all tonal categories, then we will be required to write a dissimilation rule in the form of an insertion rule, as in (8),

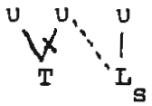
(8) $\emptyset \rightarrow (H) / LL\_\_L$

so that the first L will remain available for deletion, and furthermore, we will be required to order it before Initial Tone Deletion so that (H) will be inserted after LL and not HL to obtain correct results.

A second way out of the difficulty is to have a feature-changing rule, $L \rightarrow H / L\_\_L$, which will apply only to the LL class, but will then require a less general Initial Tone Deletion rule written to exclude the LL class. Such a solution is advocated by Yip.[8] However, in this analysis, the invisibility of the first tone marker to mapping will be related in section 2 to the vowel changes, so that the more general rule is to be preferred, and ordering will be accepted here.

The rule deriving the 52 contours for the IA, IIIA, IIIB and IVA1 classes will be virtually identical to that presented in Yip (1980); strong low tones extend their domain onto the weaker syllable unless blocked by (H). This can be done in an autosegmental framework via reassociation lines.

(9) Low Tone Reassociation[9]



The tonal rules needed in this analysis are repeated below. (shows an ordering dependency.

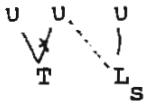
(10) Tonal Rules for Fuzhou

LHL Simplification: $L \rightarrow \emptyset / LH\_\_\_{}_{w}$

Low-Tone Dissimilation: $\emptyset \rightarrow (H) / LL\_\_L$

Initial Tone Deletion: $T_1 \rightarrow \emptyset \quad [_{\phi} \_\_\_$

Low Tone Reassociation:



2. Fuzhou Vowel Changes

The vowel change problem for Fuzhou is as follows. We have seen that syllables bearing rising or rise-fall citation tones (IIIA, IIIB, IVA1) have sandhi contours of high-level or high-fall.[10] When syllables of these classes change their tone, certain vowel quality changes also take place and there is an apparent raising of some low vowels to mid and mid to high.

Table 2 is adapted from T'au (1930). I have excluded his ɛ/æ alternation, as I have not found this, nor have other authors. There is an additional vowel change not given in this chart, which is that a alternates with e, for some lexical items, but not for others. So, we have p'a?^{13} 'hit' and p'a^{44} nøim^{52} 'hit a person', but t'a^{12} 'substitute', and t'ɛ^{44} liŋ^{44} 'substitute-body = stuntman'. Because of their irregularity, I assume that these changes are marked in the lexicon, and will not discuss them further.

On the left of Table 2 are listed the finals which show alternation. Classes IA, IB, II and IVB show no alternation of vowels and display the finals under the A heading. Classes IIIA, IIIB and IVA1 show the alternation and have the B form in isolation or in strong position in the foot, and the A form in sandhi position. Non-alternating finals which exist in all classes are shown on the right. ŋ stands for either ŋ or ?.

(11) TABLE 2

Fuzhou Final Alternations

ALTERNATING FINALS		NON-ALTERNATING FINALS
A	B	a
		aŋ
i	ei	ɔ
iŋ	eiŋ	œ
u	ou	ai
uŋ	ouŋ	au
y	øy	ya
yŋ	øyŋ	yaŋ
øy	əy	ye
øyŋ	əyŋ	yeŋ
ouŋ	auŋ	wa
eiŋ	aiŋ	waŋ
		wɔ
		wɔŋ
		wai
		wei
		yɔ
		yɔŋ

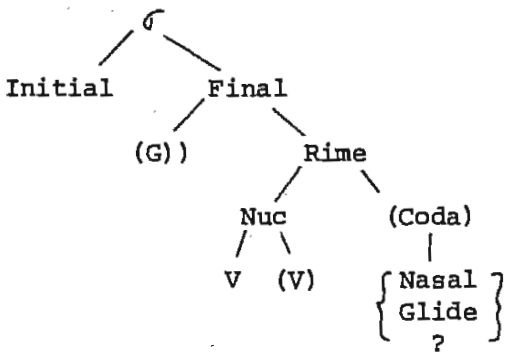
Two facts are readily apparent from this chart. (1) Within the non-alternating groups we see no cases of VVC.[11] This contrasts with the alternating group where over half the finals are of the VVC type, at least in column B. (2) Secondly, we can see that reference to the coda will be

necessary at least to describe the fact that aun alternates with oun, whereas au shows no alternation, and similarly, ain alternates with ein, whereas ai shows no alternation. Reference to the coda will not be required for the mid vowels showing alternation.

This analysis draws on Maddieson (1976) who suggests that an assimilation process may be at work in the weakened position. He suggests that certain phonemic distinctions of both tone and vowel quality are lost in the less prominent position. However, he claims that the assimilation process involves lengthening as well as assimilation, and this is not the case, syllables in weak position are noticeably shorter than in strong. Rather, the "assimilation" insight should be captured in terms of allowable syllable types in weak position and in strong.

In Section 1, Chinese syllables were claimed to be of the type:

(12)



Evidence for putting the glide in the Final, as in traditional Chinese syllable structures, rather than the onset, involve restrictions between the glide and the rime of the syllable. Although there are four possible positions within the final, in fact at most we find three occurring. A possible statement of this restriction is: If there is a glide, then the nucleus cannot be branching. This still leaves the structures of ai, au, etc. in question.

There are four low diphthong finals: ai, ain, au, and aun, of which ain and aun must be said to have branching nuclei. I suggest that the diphthongs ai and au are nucleus + coda, whereas the ei, ou diphthongs of the B series represent branching nuclei. We need rules to dintinguish the types, however. Let us propose the constraint that the features of the parts of the nucleus should differ in the unmarked case by at most one height feature, and that the glide be interpreted as part of the nucleus in the unmarked case. For ain and aun, the second part of the diphthong for these cannot be analyzed as being part of the coda, since that position is filled, so they represent marked branching-nuclei syllables. Therefore, the non-alternating finals will all have non-branching nuclei and the finals in column B will all have branching nuclei.

Now, if we add a constraint that weakened duration on the w syllable can be expressed by non-branching nuclei, then we need rules for converting branching B finals into A finals which are to be seen as non-branching. The last four finals in column A at first seem to present a glaring counter-

example to the branchingness constraint. However, I auggest that they are actually segmental diphthongs of the type discussed by Anderson (1972).[12] He discusses instances of segments which are heterogeneous with respect to a single feature and discusses both monophthongization and diphthongization processes involving this type of segment. It is interesting that in the branching nucleus, we can have diphthongs differing in more than one feature, whereas the diphthongs that I am suggesting are segmental differ in only one feature, let us say, following Anderson, [± compact]. The markedness for distribution of the feature within the segment follows Anderson's Principle of Intrasegmental Variation, distributing the feature in the unmarked-marked order.

Now, we can form a general rule for forming non-branching nuclei in weak position.

(13) a. If the two parts of the nucleus agree on all features but one, (i.e., ei, ou, øy), delete the first segment. This segment deletion rule mirrors the tone deletion rule.

b. If the two parts of the nucelus disagree on more than one feature, a segmental diphthong is formed, with basic quality determined by the second member (quasi-deletion). This segmental diphthong will be heterogeneous with respect to a single feature [± compact] with the heterogeneous feature being distributed in the order unmarked-marked.

This analysis, which uses a distinction between branching and non-branching nuclei appears to solve one formal problem. If we were to have a simple vowel-raising rule operating in conjunction with high tone, that rule would have to mention a fairly complex environment, i.e. low vowels raise only if not preceded by a glide and if at the same time followed by a consonantal coda, which coda can be either voiced (ŋ) or voiceless (ʔ). While it is known that consonants can affect tones, such a grouping of final voiced-voiceless conditioning would appear to be unusual.

However, since it is desirable to include a syllable-structure template mentioning branching nuclei in order to capture distribution of segments within the final, that template may then be used to express the structural difference between the two types of low diphthongs and their differing behaviors.

3. Conclusion

This analysis has suggested that there is an effect of metrical position on both tonal phenomena and on structure of the syllable, specifically the nucleus, with two deletion rules forming the bulk of the analysis. The claim is that it is only a seeming generalization that H and L tones correlate with certain vowel qualities, and the real generalization is the weakening of contrasts via deletion within the weak member of the foot.

APPENDIX

EXAMPLES OF SANDHI GROUPS

(The first line gives the isolation form of each syllable of the group; the second line gives the output of the sandhi rules. In addition to the tone and vowel changes, there are also consonantal changes in many cases; these will not be discussed in this paper.)

IA+IA

飛機

	hi^{44}	ki^{44}
fly+machine	hi^{44}	ki^{44}
'airplane'		

IA+IB

衣裳

	ʔi^{44}	swɒŋ^{52}
'clothing'	ʔi^{44}	lwɒŋ^{52}

IA+II

妓女

	ki^{44}	nü^{22}
prostitute+female	ki^{52}	nü^{22}
'prostitute'		

IA+IIIA

青菜

	cIŋ^{44}	ts'ai^{12}
fresh+vegetable	cIŋ^{52}	ts'ai^{12}

IA+IIIB

感動

feeling+move	kan^{44}	touŋ^{242}
'emotion'	kan^{52}	touŋ^{242}

IA+IVA

雞角

rooster+suff.	kyɛ^{44}	k'øiʔ^{13}
'rooster'	kyɛ^{52}	ʔøiʔ^{13}

IA+IVB

生活

life, livelihood	sIŋ^{44}	waʔ^{4}
	sIŋ^{44}	waʔ^{4}

IB+IA 長衫
long+shirt
'Chinese dress'
touŋ^{52} saŋ^{44}
tʊŋ^{22} naŋ^{44}

IB+IB 洋油
foreign+oil
'kerosene'
yʊŋ^{52} yü^{52}
yʊŋ^{22} yü^{52}

IB+II 蘋果
apple
pIŋ^{52} kwɔ^{22}
pIŋ^{22} wɔ^{22}

IB+IIIA 王厝
Wang+house
'a servant named Wang'
wɔŋ^{52} tswɔ^{12}
wɔŋ^{22} tswɔ^{12}

IB+IIIB 時候
'time'
si^{52} hau^{242}
si^{22} ʔau^{42}

IB+IVA 麻雀
'sparrow'
ma^{52} ts'wɔʔ^{13}
ma^{22} ts'wɔʔ^{13}

IB+IVB 學術
magic
mɔ^{52} suʔ^{4}
mɔ^{22} luʔ^{4}

II+IA 買書
buy+books
mɛ^{22} jü^{44}
mɛ^{22} jü^{44}

II+IB 草蜢
grasshopper
ts'au^{22} maŋ^{52}
ts'au^{22} maŋ^{52}

II+II 管閒
troublesome
ku^{22} nɔ^{22}
ku^{35} nɔ^{22}

II+IIIA 買布
buy+cloth
mɛ^{22} pwɔ^{12}
mɛ^{35} pwɔ^{12}

II+IIIB 買飯
buy+rice
mɛ^{22} pɔɔŋ^{242}
mɛ^{35} pɔɔŋ^{242}

II+IVA 買(肉)
buy+something
mɛ^{22} nauʔ^{13}
mɛ^{35} nauʔ^{13}

II+IVB 買肉
buy+meat
mɛ^{22} nüʔ^{4}
mɛ^{22} nüʔ^{4}

IIIA+IA 替身
for+body
'stuntman'
t'a^{12} sIŋ^{44}
t'ɛ^{44} lIŋ^{44}

IIIA+IB 報仇
revenge+grudge
pau^{12} siu^{52}
pau^{44} liu^{52}

IIIA+II 造反
'revolt'
tsau^{12} hwan^{22}
tsau^{52} hwan

IIIA+IIIA 比較
'comparatively'
pi^{12} kau^{12}
pi^{52} yau^{12}

IIIA+IIIB 印像
'impression'
ʔeiŋ^{12} tswɔŋ^{242}
ʔIŋ^{52} tswɔŋ^{242}

IIIA+IVA 考試
exam+try 'exam'
k'ɔ^{12} søi?^{13}
k'ɔ^{52} løi?^{13}

IIIA+IVB 快活 'happy'
k'a^{12} wa?^{4}
k'ɛ^{44} wa?^{4}

IIIB+IA 夏天
summer+sky 'summertime'
ha^{242} t'yɛn^{44}
ha^{44} lyɛn^{44}

IIIB+IB^{13} 大紅
large+red 'bright red'
tɔai^{242} ?øim^{52}
twai^{44} ?øiŋ^{52}

IIIB+II 代(也)
'affair'
tai^{242} yɛ^{22}
tai^{52} yɛ^{22}

IIIB+IIIA 電線
electric+wire
tyɛn^{242} syaŋ^{12}
tyɛn^{52} lyaŋ^{12}

IIIB+IIIB 命令 'order'
mɛiŋ^{242} nɛiŋ^{242}
mIŋ^{52} nɛiŋ^{242}

IIIB+IVA 老八
old+eight '#8 of children'
nɔ^{242} pai?^{13}
nɔ^{52} pai?^{13}

IIIB+IVB 有著
exist+at 'to be here'
ou^{242} tɔ?^{4}
u^{44} tɔ?^{4}

IVA1+IA 國家
country+home 'country'
kuɔ?^{13} ka^{44}
kuɔ?^{44} ka^{44}

IVA1+IB 拍人
hit+person
p'a?^{13} nøim^{52}
p'a^{44} nøim^{52}

IVA1+II 拍狗
hit+dog
p'a?^{13} k'ɛŋ^{22}
p'a^{52} k'ɛŋ^{22}

IVA1+IIIA 討厭
annoy+press
t'ɔ?^{13} yɛiŋ^{12}
t'ɔ^{52} yɛiŋ^{12}

IVA1+IIIB 鐵帽
iron+hat
k'yɛ?^{13} mau^{242}
k'yɛ^{52} mau^{242}

IVA1+IVA 可惡
able+detest 'detestable'
k'o?^{13} ?au?^{13}
k'o^{52} ?au?^{13}

IVA2+IVB 法律
method+law 'law'
hwa?^{13} lü?^{4}
hwan^{22} lü?^{4}

IVB+IA 讀書
read+books
t'øi?^{4} jü^{44}
t'øi^{4} jü^{44}

IVB+IB 禿頭
bald+head 'bald'
t'u?^{4} t'au^{52}
t'u^{4} t'au^{52}

IVB+II 食饺		
eat-dumplings	syɛʔ^{4}	kyu^{22}
	sIk^{2}	kyu^{22}
IVB+IIIA 白菜		
white+vegetable	paʔ^{4}	ts'ai^{12}
'chinese cabbage'	pa^{2}	ts'ai^{12}
IVB+IIIB 食飯		
eat+rice	syɛʔ^{4}	pɔɔŋ^{242}
	syɛp^{2}	pɔɔŋ^{242}
IVB+IVA 食肉		
eat+something	syɛʔ^{4}	nauʔ^{13}
	syɛ^{2}	nauʔ^{13}
IVB+IVB 食肉		
eat+meat	syɛʔ^{4}	nṻʔ^{4}
	syɛ^{4}	nüʔ^{4}

Notes

*I am grateful to my informant, Mrs. Yi-keng Liu for her help and for numerous explanations, and to Yasuaki Abe, Paloma Garcia-Bellido and John McCarthy for valuable suggestions. The remaining errors are mine.

[1]That is, this paper assumes w͡s metrical feet of the type outlined in Liberman and Prince (1977). This is not an uncontroversial claim, although arguments for one part of the claim, tone sandhi interaction with stress, have been presented by Ballard (1980) and Hashimoto (1980), and Yip (1980) has assumed a w͡s metrical construction for her analysis of Min dialects. Arguments for the w-s analysis are given in Wright (forthcoming).

[2]Certain clitics lack inherent tone. They are usually pronounced with a low tone in isolation, but receive context tone parasitically and will not be discussed here. Furthermore, certain verbal particles have full tone and proper sandhi when used as full verbs, but are stripped of

tone and then function like clitics with parasitic tone.

[3]I call these compounds to avoid discussion of what constitutes a "word" in Fuzhou. Sherard (1972) uses the term "phonological word" to describe similar sandhi spans in Shanghai, but the span for Shanghai and Fuzhou are different in several interesting ways. See Wright (forthcoming) for discussion of the sandhi span.

[4]Data is drawn from informant work. Sources disagree on the sandhi forms of IB and 4B, with Yip (1980) and Chen and Norman (1965) suggesting that they form a single tone class. I believe that a slightly different dialect is being described by Chen and Norman; Chao (1933) and T'au (1930) suggest even different and conflicting data here).

[5]The present analysis is not meant as an argument for the second point above, i.e. for levels as primitives, since the analysis can as easily be explicated using a dynamic tone system such as that developed by Clark (1978).

[6]Lowering is illustrated by sentence (i);lack of lowering by sentence (ii).

(i)

伊 是 一 隻 真 懶 (的) 人

he - is - one - class - very - lazy - gen - person

i^{44} sei^{242} $swɔ?^{4}$ $jyɛ?^{13}$ $jɛIŋ^{242}$ $laŋ^{12}$ i^{2} $nøim^{52}$

i^{44} si^{2} $swɔ^{2}$ $yɛ?^{13}$ $jIŋ^{52}$ $laŋ^{12}$ i^{2} $nøim^{32}$

(ii)

伊 是 什 個 人

he - is - WH - class - person

i^{44} sei^{242} $syɛ^{2}$ $kɔ^{44}$ $nøim^{52}$

i^{44} si^{2} $syɛ^{2}$ $nɔ^{44}$ $nøim^{52}$

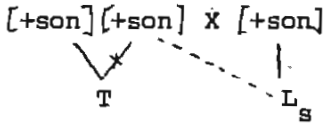
[7]IVA2 is given a representation of LL, identical to that of II with which it forms a sandhi class, even though the contour exhibited is a 13 contour. Yip (1980) gives arguments for positing a LL contour for this tone, based on the raising effects of final glottal stop, and I accept these arguments here.

[8]Yip's data differs from that presented here. IB of her data functions like IVB above, i.e., HL appears to be deleted and parasitic tone is then acquired. However, note that one could write a more general version of the LHL simplification rule and delete all falls in weak position,

$$L \rightarrow \emptyset \;/\; \ldots H \_\_\_\_ \;\; (\text{w})$$

then initial tone deletion would account for such a system. This would then mean that the revised LHL rule would also be ordered before Initial Tone Deletion.

[9]This rule is given with tone assigned to moras, rather than segments or syllables. It has been argued by Clark (1978, 1979) and Young and Chao (1979) that the mora is the domain of tone assignment in Chinese. However, this point is not at issue for this discussion and the rule could as easily be written:



[10]My data is incomplete, in that my informant has few examples of IVA2 and the examples I have found all show vowels from the non-alternating series, so that it is unclear whether IVA2 vowels also alternate. Furthermore, I have a few examples of non-IIIA/B-IVA syllables which should show the A type of final actually showing the B type of final and alternation, i.e. touŋ^{52} saŋ^{44} ⇒ tɯŋ^{22} naŋ^{44} 'Chinese dress'. In addition, in certain cases, low vowels of either alternating or non-alternating groups reduce to ə. Thus, the actual situation is more complicated than described here, but the main body of changes are as described by T'au and others, and the irregular changes I have found are not inconsistent with the analysis presented here.

[11]Actually, we see cases of VVG such as tɯai^{242} 'large ⇒ twai^{44}. These can be treated as having wai final, and w becomes vocalic when in the three-mora IIIB syllable.

[12]Preliminary spectrographic evidence suggests that the weak nuclei of monophthongs and what I am positing as segmental diphthongs in weak position are approximately of equal duration. For example, the nuclei of si^{22}ʔau^{242} (時候) from si^{52} +hau^{242} and nøi^{2} jyɛʔ^{13} (大使) from nøiʔ^{4} jyɛʔ^{13} are roughly equal. A more controlled study, matching syllable types for presence/absence of coda, vowel height, etc. is in progress at the present time.

[13]m is not given in the finals inventory; my informant shows m after øi (øy) in isolation.

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